

NOTES

ADDITIONS TO THE PEATLAND FLORA OF THE SOUTHERN ROCKY MOUNTAINS: HABITAT DESCRIPTIONS AND WATER CHEMISTRY. — David J. Cooper, Department of Environmental Sciences and Engineering Ecology, Colorado School of Mines, Golden, CO 80401.

Investigations of the flora and ecology of three minerotrophic peatlands (fens) in the area of South Park, Park County, central Colorado, during 1989 resulted in the addition of a number of important new vascular plant species records, rediscoveries and range extensions for the southern Rocky Mountains. Peatlands are wetlands with organic soils. They usually are waterlogged for much of the growing season. The two main classes of peatlands are bog and fen. Bogs are ombrotrophic and ombrogenous while fens are minerotrophic. Bogs are restricted to humid regions and do not occur in the southern Rocky Mountains. Fens can occur wherever a constant water supply is available. The mineral nutrients in the water supply also determine the nutrients available to the plants living in the fen. Where the water has been in contact only with hard crystalline rocks, relatively nutrient poor conditions may occur and a poor fen develops. Where water has been in contact with calcareous substrates relatively nutrient rich water occurs and rich or extremely rich fen conditions occur. Intermediate fens have conditions intermediate between poor and rich fens. The rich to poor fen gradient is based solely on nutrients not species richness, but many plant species with exacting nutrient requirements are restricted to intermediate or rich fens and some to extreme rich fens. The chemical characteristics of the different types of fens has been carefully defined for Minnesota (Glaser, USDI Fish and Wildlife Service, Biological Report 85(7.14), 1987), but not for the Rocky Mountains. Plant nomenclature follows Weber (Colorado Flora: Eastern Slope, 1990).

Fens are fairly common in many portions of the southern Rocky Mountains at elevations above 2600 meters. Poor to intermediate fens are the most common type because the crystalline bedrock of most mountain ranges releases few nutrients and a large flush of nutrient poor snowmelt water dominates their hydrologic regime early in the summer.

The three fens investigated in the present study are ecologically distinct. The High Creek fen is an extremely rich fen, fed by springs whose water supply has been in contact with calcareous bedrock, till and outwash from the Mosquito Range on the western side of South Park (Fig. 1). It occurs at an elevation of 2950 m. The fen covers an area of approximately 485 hectares. The water chemistry is shown in Table 1.

The East Lost Park fen is an intermediate fen in the Tarryall Mountains on the northeastern side of South Park. It occurs at an elevation of 2743 m. The Tarryall Mountains are a range of unglaciated granitic domes. The large floating mats of these spring-fed peatlands indicate the later stages of hydroseres, with very little open water remaining. The water chemistry is shown in Table 1.

TABLE 1. WATER CHEMISTRY. pH measured with Corning model 101 pH millivolt meter. Conductance measured with YSI C-S-T meter, in mmhos/cm². Calcium, sodium and magnesium cations measured directly from filtered and acidified water samples with a Perkin-Elmer atomic absorption spectrophotometer.

	pH	Conduc- tance	Ca ⁺⁺	Na ⁺	Mg ⁺⁺
High Creek	7.4–8.6	270–640	43–94	7–32	21–68
E. Lost Park	6.3–6.9	24–59	2.4–4.1	2.3–3.3	0.4–0.8
Guanella Pass	6.9–7.3	90–98	19–57	2.3–3.2	4.0–4.2

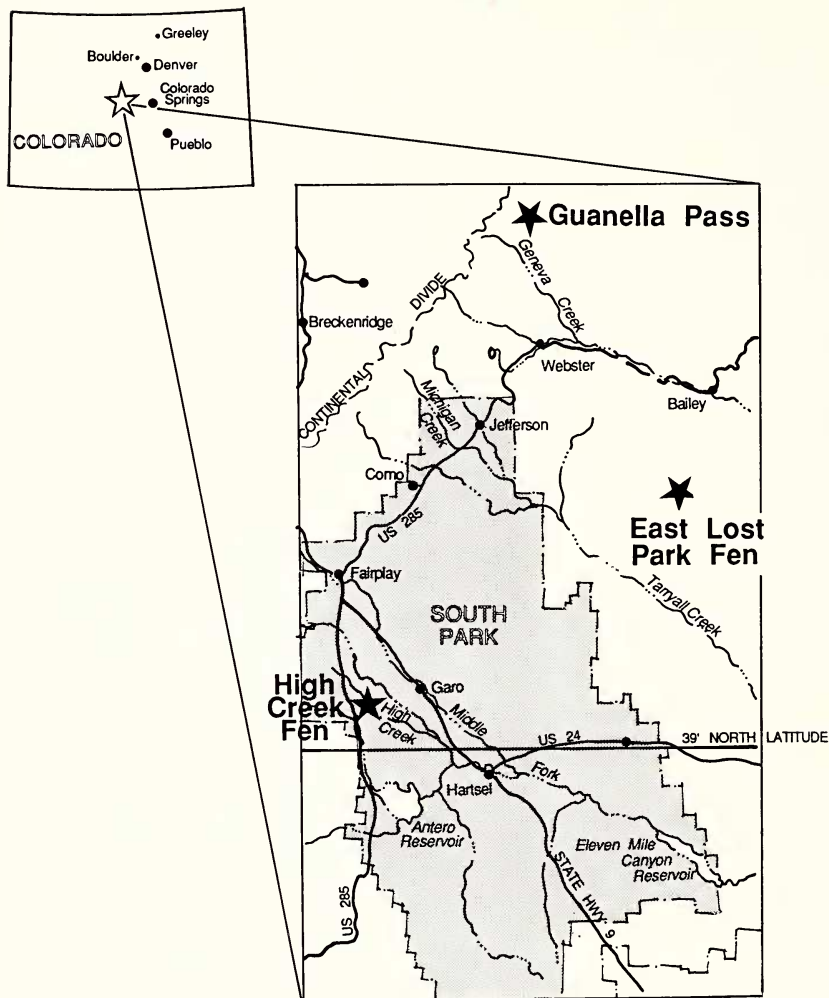


FIG. 1. Central Colorado peatland study sites.

The Guanella Pass fens occur just below the summit of Guanella Pass on the north side of South Park at an elevation of 3540 m. The peatlands are spring-fed rich fens. Peat accumulation occurs around pools which have abundant moss cover. The water chemistry is shown in Table 1.

The High Creek fen contains a number of communities which are dominated by *Carex aquatilis* Wahlenberg, *Eleocharis quinqueflora* (Hartman) Schwartz, *Kobresia simpliciuscula* (Wahlenberg) Mackenzie, *Triglochin maritima* L. and *Juncus alpino-articulatus* Chaix. The following rare species were also collected. *Salix myrtilifolia* Andersson sensu Argus (*Cooper 1678*, COLO, CAN) is a calciphile at its southern range limit. It is a North American species that is widespread in the boreal regions of the continent. The South Park population is apparently the first reported in the

western United States. This species has been reported from Wyoming (Dorn Vascular Plants of Wyoming, Mountain West, 1987), however, according to Argus (personal communication to W. A. Weber), the Wyoming plants are glaucous and do not represent the typical form of the species. The species occupies peat hummocks throughout the wetter portion of the fen. *Salix candida* Fluegge (Cooper 1677, COLO), also present, is otherwise known in Colorado only from the Laramie River drainage, 160 km to the north, and occurs on hummocks with *S. myrtilifolia*. *Packera* (*Senecio*) *pauciflora* (Pursh) A. Löve & D. Löve grows on peat hummocks throughout the fen (Weber and Cooper 18016, COLO). It is a North American species that has been reported previously in the Rocky Mountains as far south as northern Wyoming. *Carex scirpoidea* Michx. was rediscovered here (Weber and Cooper 18027, COLO). It was known previously from an historic specimen collected in South Park by John Wolf. It is very common at this site, dominating the more seasonally dry fen margins. It is noted also in the Lost Park fen and in peatlands along Sacramento Creek west of Fairplay, also in South Park. *Carex viridula* Michx. occurs scattered on hummocks throughout the fen (Weber and Cooper 18021, COLO). It is known previously in Colorado only from the San Juan Mountains. *Trichophorum pumilum* (Vahl) Schinz & Thellung (*Scirpus pumilus*) another very rare species is common on peat hummocks with *Kobresia simpliciuscula*.

The floating peat mats in East Lost Park are dominated by *Carex limosa* L. and *Eleocharis quinqueflora*. Growing in the mats is *Carex livida* (Wahlenberg) Willd., a boreal circumpolar species that has been reported previously in the Rocky Mountain region as far south as northern Montana and Idaho (Weber and Cooper 18034, COLO). This species has been found also in the Boston Peak wetland in the Laramie River drainage (Cooper 1680, COLO) and in the High Creek fen (Cooper 1685, COLO). Scattered populations of *Carex tenuiflora* Wahlenb. also occur in the floating mats at East Lost Park (Weber and Cooper 18036, COLO). This is a boreal circumpolar species that is new to the contiguous western U.S. and represents a range extension westward from Minnesota. *Eriophorum gracile* K. Koch forms large reddish colored lawns on the floating mats in East Lost Park (Weber and Cooper 18035, COLO). It was also found in the Sacramento Creek drainage (Weber and Cooper 18040, COLO) and in the Guanella Pass fen (Cooper 1691, COLO).

The occurrence of these taxa in Colorado underscores the long-term stability and importance of peatlands as critical habitat for small disjunct populations of plant species whose present distribution is largely boreal.

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STATUS AND DISTRIBUTION OF *CASTILLEJA MOLLIS* (SCROPHULARIACEAE).—Lawrence R. Heckard, Jepson Herbarium, University of California, Berkeley, CA 94720, Stephen W. Ingram, Herbarium, University of California, Santa Barbara, CA 93106; Tsan-lang Chuang, Dept. of Biological Sciences, Illinois State University, Normal, IL 61761.

Castilleja mollis Pennell (Proceedings of the Academy of Natural Sciences, Philadelphia 99:185, 1947), a federal C2 candidate for listing under the Endangered Species Act, was described on the basis of a single collection from Santa Rosa Island of the Channel Islands of California. The epithet reflects the indument of branched hairs. The distribution of this species, considered by Pennell (in Abrams, Illustrated Flora of the Pacific States 3:836, 1951) to be a Santa Rosa Island endemic, was expanded by Munz (A California Flora, 1959, p. 669) and Bacigalupi (Leaflets in Western Botany